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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/734,147	12/11/2000	David Lahiri Bhatoolaul	2-2	4207

22046 7590 06/24/2004

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EXAMINER	
PERILLA, JASON M	
ART UNIT	**PAPER NUMBER**
2634	9

DATE MAILED: 06/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/734,147	BHATOOLAUL ET AL.	
	Examiner	Art Unit	
	Jason M Perilla	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 December 2000*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5,9-15 and 19-27* is/are rejected.

7)☒ Claim(s) *6-8 and 16-18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 December 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6-12/00*.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1. Claims 1-27 are pending in the instant application.

Priority

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

3. The information disclosure statement (IDS) submitted on December 11, 2000 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

4. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. ***It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited.*** The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

Claim Objections

5. Regarding claim 20, “comprising the steps of:” should be replaced by – comprising—because it is an apparatus claim rather than a method claim.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-5, 11-15, 19 and 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narvinger et al (US 6381229; hereafter "Narvinger") in view of Rice (US 5463657), in further view of Slonneger et al ("Noncoherent Parallel Acquisition of Pn Sequences in Direct-Sequence Spread-Spectrum Systems"; hereafter "Slonneger"), and in further view of Gibson ("The Communications Handbook").

Regarding claims 1 and 23, Narvinger discloses a method of random access in a mobile communications system using random access channels in a wideband code division multiple-access (WCDMA) system (abstract). Narvinger discloses that a received WCDMA random access signal is correlated and despread (fig. 9; col. 12, lines 27-31). Narvinger further discloses that the random access signal is comprised of a preamble and data portion wherein the preamble contains a unique signature pattern for identification (col. 2, lines 10-18). It is described by Narvinger that in the random access communications system the identification and processing of signals must be performed quickly (col. 1, lines 30-45). Therefore, Narvinger discloses using a fast Walsh-Hadamard transform to quickly detect a signature within a preamble (col. 8, lines 9-15; col. 7, lines 37-49). Although the use of a fast transform implies correlation by a set of index values, Narvinger does not explicitly disclose correlating the preamble signal with the set of preamble sequences in accordance with a fast transform to

generate a set of index values, forming a decision statistic based on the set of index values, and selecting, as the detected one of the set of preamble sequences, a preamble sequence corresponding to the decision statistic. However, Rice teaches a spread spectrum system using non-coherent (fast transform) correlation techniques (col. 7, line 53 – col. 8, line 18), generating a set of index values or permuted sequences (col. 7, lines 60-63), forming a decision statistic based on the set of index values (col. 8, lines 6-18), and selecting, as the detected one of the set of sequences, a sequence corresponding to the decision statistic (col. 8, lines 16-18). Rice also teaches the benefits of using fast transforms to compute correlations (col. 7, lines 35-40). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize the particular non-coherent correlation technique using fast transforms as taught by Rice for the selection of a preamble sequence method of Narvinger because it could be performed quickly and efficiently.

Further regarding claims 1 and 23, while Narvinger in view of Rice disclose correlating the received random access channel signal, they do not disclose correlating the received spread signal with a first fast transform to provide a preamble signal. However, the use of non-coherent correlation techniques are well known in the art (described by Rice for a preamble sequence) and are taught and exemplified by Slonneger. Slonneger teaches the use of fast transforms for correlation of spread spectrum communications systems (pg. 31; col. 2, lines 1-16). Further, Slonneger teaches that fast transforms are advantageous because they are able to achieve synchronization quickly as required by the random access communications system of

Narvinger in view of Rice. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize a fast transform as taught by Slonneger for correlation of the random access communication of Narvinger in view of Rice because it could quickly achieve synchronization.

Further regarding claims 1 and 23, Narvinger in view of Rice, and in further view of Slonneger do not disclose correlation of the received random access communications signal by one of a set of Gold Code sequences. However, Gibson teaches the well known properties of Gold Codes for spread spectrum systems. Namely, Gold Codes represent codes that have low crosscorrelation (pg. 99, lines 22-23). One skilled in the art understands that the use of codes having low crosscorrelation is beneficial in spread spectrum systems for the independence of the plurality of data signals being communicated. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize Gold Codes as pseudo-random spreading sequences as taught by Gibson in the communications method of Narvinger in view of Rice and in further view of Slonneger because Gold Codes have low crosscorrelation properties. With the use of Gold Codes as a spreading sequence, it would be obvious to correlating the received spread signal with sequences of a first orthogonal Gold Code set in accordance with a first fast transform to provide a de-spread signal and the accompanying preamble.

Regarding claim 2, Narvinger in view of Rice, in further view of Slonneger, and in further view of Gibson disclose the limitations of claim 1 as applied above. Further, Rice discloses a method of fast transform comprising the steps of: multiplying the

received spread signal with a first sequence vector and a forward permutation vector to generate a permuted sequence signal (col. 7, lines 52-63), wherein the first code set is generated from the first sequence vector and a cyclic shift matrix of a second sequence vector (col. 13, line 47 – col. 14, line 12), and the forward permutation vector maps between i) the cyclic shift matrix and ii) a matrix of Walsh-Hadamaard sequences; and 2) applying the fast Hadamaard transform to the permuted sequence signal to generate a set of correlated signals (col. 8, lines 5-18), the preamble signal selected as one of the set of correlated signals based on a predetermined decision criterion (col. 8, lines 13-18). It is obvious that since the codes used in the method are advantageously Gold Code sequences that the transform would be one of a fast orthogonal "Gold Code" transform using the Gold Code sequence set. It is obvious that the transform described by Rice could be used to match either the received signal itself or also the preamble sequence.

Regarding claim 3, Narvinger in view of Rice, in further view of Slonneger, and in further view of Gibson disclose the limitations of claim 1 as applied above. Further, Rice discloses that for step (b), the set of preamble sequences are selected from a OGC set (inherent) formed from first and second sequence vectors (col. 13, line 47 – col. 14, line 12), the OGC set generated from the first sequence vector and a cyclic shift matrix of a second sequence vector (col. 13, line 47 – col. 14, line 12); and wherein the second fast transform is a fast orthogonal Gold code transform (FOGT) comprising the steps of 1) multiplying the preamble signal with a first sequence vector and a forward permutation vector to generate a permuted preamble signal (col. 7, lines 52-63), the

forward permutation vector mapping between i) the cyclic shift matrix and ii) a matrix of Walsh-Hadamaard sequences (col. 8, lines 5-18), and 2) applying the fast Hadamaard transform to the permuted preamble signal to generate the set of index values (col. 7, lines 45-50). It is obvious that the transform described by Rice could be used to match either the received signal itself or also the preamble sequence.

Regarding claim 4, Narvinger in view of Rice, in further view of Slonneger, and in further view of Gibson disclose the limitations of claim 1 as applied above. Further, Rice discloses that for step (b), the set of preamble sequences are selected from set of Walsh-Hadamaard sequences (col. 8, lines 5-18), and the second fast transform is a fast Hadamaard transform (col. 7, lines 45-50).

Regarding claim 5, Narvinger in view of Rice, in further view of Slonneger, and in further view of Gibson disclose the limitations of claim 1 as applied above. Further, Narvinger discloses that for step (a), the received spread signal is a burst of a random-access channel in a code-division, multiple-access communication system (abstract).

Regarding claim 11, Narvinger discloses a preamble detector for detecting one of a set of preamble sequences in a spread signal (abstract) comprising: a first correlator (fig. 9, refs. 413 and 418) correlating the received spread signal with a set of orthogonal sequences to provide a preamble (fig. 9; col. 12, lines 27-31). Narvinger discloses that a received WCDMA random access signal is correlated and despread (fig. 9; col. 12, lines 27-31). Narvinger further discloses that the random access signal is comprised of a preamble and data portion wherein the preamble contains a unique signature pattern for identification (col. 2, lines 10-18). It is described by Narvinger that in the random

access communications system the identification and processing of signals must be performed quickly (col. 1, lines 30-45). Therefore, Narvinger discloses using a second correlator correlating the preamble signal using a fast Walsh-Hadamard transform to quickly detect a signature within a preamble (col. 8, lines 9-15; col. 7, lines 37-49). Although the use of a fast transform implies correlation by a set of index values, Narvinger does not explicitly disclose correlating the preamble signal with the set of preamble sequences in accordance with a fast transform to generate a set of index values, a circuit forming a decision statistic based on the set of index values, and a selector selecting, as the detected one of the set of preamble sequences, a preamble sequence corresponding to the decision statistic. However, Rice teaches a spread spectrum system using non-coherent (fast transform) correlation techniques (col. 7, line 53 – col. 8, line 18), generating a set of index values or permuted sequences (col. 7, lines 60-63), forming a decision statistic based on the set of index values (col. 8, lines 6-18), and selecting, as the detected one of the set of sequences, a sequence corresponding to the decision statistic (col. 8, lines 16-18). Rice also teaches the benefits of using fast transforms to compute correlations (col. 7, lines 35-40). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize the particular non-coherent correlation technique using fast transforms as taught by Rice for the selection of a preamble sequence method of Narvinger because it could be performed quickly and efficiently.

Further regarding claim 11, while Narvinger in view of Rice disclose correlating the received random access channel signal, they do not disclose correlating the

received spread signal with a first fast transform to provide a preamble signal. However, the use of non-coherent correlation techniques are well known in the art (described by Rice for a preamble sequence) and are taught and exemplified by Slonneger. Slonneger teaches the use of fast transforms for correlation of spread spectrum communications systems (pg. 31; col. 2, lines 1-16). Further, Slonneger teaches that fast transforms are advantageous because they are able to achieve synchronization quickly as required by the random access communications system of Narvinger in view of Rice. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize a fast transform as taught by Slonneger for correlation of the random access communication of Narvinger in view of Rice because it could quickly achieve synchronization.

Further regarding claim 11, Narvinger in view of Rice, and in further view of Slonneger do not disclose correlation of the received random access communications signal by one of a set of Gold Code sequences. However, Gibson teaches the well known properties of Gold Codes for spread spectrum systems. Namely, Gold Codes represent codes that have low crosscorrelation (pg. 99, lines 22-23). One skilled in the art understands that the use of codes having low crosscorrelation is beneficial in spread spectrum systems for the independence of the plurality of data signals being communicated. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize Gold Codes as pseudo-random spreading sequences as taught by Gibson in the communications method of Narvinger in view of Rice and in further view of Slonneger because Gold Codes have

low crosscorrelation properties. With the use of Gold Codes as a spreading sequence, it would be obvious to correlating the received spread signal with sequences of a first orthogonal Gold Code set in accordance with a first fast transform to provide a de-spread signal and the accompanying preamble.

Regarding claim 12, Narvinger in view of Rice, in further view of Slonneger, and in further view of Gibson disclose the limitations of claim 11 as applied above. Further, Rice discloses a method of fast transform comprising the steps of: multiplying the received spread signal with a first sequence vector and a forward permutation vector to generate a permuted sequence signal (col. 7, lines 52-63), wherein the first code set is generated from the first sequence vector and a cyclic shift matrix of a second sequence vector (col. 13, line 47 – col. 14, line 12), and the forward permutation vector maps between i) the cyclic shift matrix and ii) a matrix of Walsh-Hadamaard sequences; and 2) applying the fast Hadamaard transform to the permuted sequence signal to generate a set of correlated signals (col. 8, lines 5-18), the preamble signal selected as one of the set of correlated signals based on a predetermined decision criterion (col. 8, lines 13-18). It is obvious that since the codes used in the method are advantageously Gold Code sequences that the transform would be one of a fast orthogonal "Gold Code" transform using the Gold Code sequence set. It is obvious that the transform described by Rice could be used to match either the received signal itself or also the preamble sequence.

Regarding claim 13, Narvinger in view of Rice, in further view of Slonneger, and in further view of Gibson disclose the limitations of claim 11 as applied above. Further,

Rice discloses that for step (b), the set of preamble sequences are selected from a OGC set (inherent) formed from first and second sequence vectors (col. 13, line 47 – col. 14, line 12), the OGC set generated from the first sequence vector and a cyclic shift matrix of a second sequence vector (col. 13, line 47 – col. 14, line 12); and wherein the second fast transform is a fast orthogonal Gold code transform (FOGT) comprising the steps of 1) multiplying the preamble signal with a first sequence vector and a forward permutation vector to generate a permuted preamble signal (col. 7, lines 52-63), the forward permutation vector mapping between i) the cyclic shift matrix and ii) a matrix of Walsh-Hadamaard sequences (col. 8, lines 5-18), and 2) applying the fast Hadamaard transform to the permuted preamble signal to generate the set of index values (col. 7, lines 45-50). It is obvious that the transform described by Rice could be used to match either the received signal itself or also the preamble sequence.

Regarding claim 14, Narvinger in view of Rice, in further view of Slonneger, and in further view of Gibson disclose the limitations of claim 11 as applied above. Further, Rice discloses that for step (b), the set of preamble sequences are selected from set of Walsh-Hadamaard sequences (col. 8, lines 5-18), and the second fast transform is a fast Hadamaard transform (col. 7, lines 45-50).

Regarding claim 15, Narvinger in view of Rice, in further view of Slonneger, and in further view of Gibson disclose the limitations of claim 11 as applied above. Further, Narvinger discloses that for step (a), the received spread signal is a burst of a random-access channel in a code-division, multiple-access communication system (abstract).

Regarding claim 19, Narvinger in view of Rice, in further view of Slonneger, and in further view of Gibson disclose the limitations of claim 11 as applied above. Further, Rice discloses the use of commercial processors (col. 15, lines 45-57). A processor is a type of integrated circuit.

Regarding claim 24, Narvinger in view of Rice, in further view of Slonneger, and in further view of Gibson disclose the limitations of claim 23 as applied above. Further, Rice discloses a method of fast transform comprising the steps of: multiplying the received spread signal with a first sequence vector and a forward permutation vector to generate a permuted sequence signal (col. 7, lines 52-63), wherein the first code set is generated from the first sequence vector and a cyclic shift matrix of a second sequence vector (col. 13, line 47 – col. 14, line 12), and the forward permutation vector maps between i) the cyclic shift matrix and ii) a matrix of Walsh-Hadamaard sequences; and 2) applying the fast Hadamaard transform to the permuted sequence signal to generate a set of correlated signals (col. 8, lines 5-18), the preamble signal selected as one of the set of correlated signals based on a predetermined decision criterion (col. 8, lines 13-18). It is obvious that since the codes used in the method are advantageously Gold Code sequences that the transform would be one of a fast orthogonal "Gold Code" transform using the Gold Code sequence set. It is obvious that the transform described by Rice could be used to match either the received signal itself or also the preamble sequence.

Regarding claim 25, Narvinger in view of Rice, in further view of Slonneger, and in further view of Gibson disclose the limitations of claim 23 as applied above. Further,

Rice discloses that for step (b), the set of preamble sequences are selected from a OGC set (inherent) formed from first and second sequence vectors (col. 13, line 47 – col. 14, line 12), the OGC set generated from the first sequence vector and a cyclic shift matrix of a second sequence vector (col. 13, line 47 – col. 14, line 12); and wherein the second fast transform is a fast orthogonal Gold code transform (FOGT) comprising the steps of 1) multiplying the preamble signal with a first sequence vector and a forward permutation vector to generate a permuted preamble signal (col. 7, lines 52-63), the forward permutation vector mapping between i) the cyclic shift matrix and ii) a matrix of Walsh-Hadamaard sequences (col. 8, lines 5-18), and 2) applying the fast Hadamaard transform to the permuted preamble signal to generate the set of index values (col. 7, lines 45-50). It is obvious that the transform described by Rice could be used to match either the received signal itself or also the preamble sequence.

8. Claims 9, 10, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Narvinger et al (US 6381229; hereafter "Narvinger") in view of Rice (US 5463657) and in further view of Slonneger et al ("Noncoherent Parallel Acquisition of Pn Sequences in Direct-Sequence Spread-Spectrum Systems"; hereafter "Slonneger").

Regarding claims 9 and 26, Narvinger discloses a method of random access in a mobile communications system using random access channels in a wideband code division multiple-access (WCDMA) system (abstract). Narvinger discloses that a received WCDMA random access signal is correlated and despread (fig. 9; col. 12, lines 27-31). Narvinger further discloses that the random access signal is comprised of a

preamble and data portion wherein the preamble contains a unique signature pattern for identification (col. 2, lines 10-18). It is described by Narvinger that in the random access communications system the identification and processing of signals must be performed quickly (col. 1, lines 30-45). Narvinger also discloses that the preamble sequences are spread with Gold Codes (col. 8, lines 20-25). Therefore, Narvinger discloses correlating the preamble signal with a set of Gold Codes using a fast transform to quickly detect a signature within a preamble (col. 8, lines 9-15; col. 7, lines 37-49). Although the use of a fast transform implies correlation by a set of index values, Narvinger does not explicitly disclose correlating the preamble signal with the set of preamble sequences in accordance with a fast transform to generate a set of index values, forming a decision statistic based on the set of index values, and selecting, as the detected one of the set of preamble sequences, a preamble sequence corresponding to the decision statistic. However, Rice teaches a spread spectrum system using non-coherent (fast transform) correlation techniques (col. 7, line 53 – col. 8, line 18), generating a set of index values or permuted sequences (col. 7, lines 60-63), forming a decision statistic based on the set of index values (col. 8, lines 6-18), and selecting, as the detected one of the set of sequences, a sequence corresponding to the decision statistic (col. 8, lines 16-18). Rice also teaches the benefits of using fast transforms to compute correlations (col. 7, lines 35-40). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize the particular non-coherent correlation technique using fast transforms as

taught by Rice for the selection of a preamble sequence method of Narvinger because it could be performed quickly and efficiently.

Further regarding claims 9 and 26, while Narvinger in view of Rice disclose correlating the received random access channel signal, they do not disclose correlating the received spread signal with a first fast transform to provide a preamble signal. However, the use of non-coherent correlation techniques are well known in the art (described by Rice for a preamble sequence) and are taught and exemplified by Slonneger. Slonneger teaches the use of fast transforms for correlation of spread spectrum communications systems (pg. 31; col. 2, lines 1-16). Further, Slonneger teaches that fast transforms are advantageous because they are able to achieve synchronization quickly as required by the random access communications system of Narvinger in view of Rice. Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize a fast transform as taught by Slonneger for correlation of the random access communication of Narvinger in view of Rice because it could quickly achieve synchronization.

Regarding claim 10, Narvinger in view of Rice and in further view of Slonneger disclose the limitations of claim 9 as applied above. Further, Rice discloses that for step (b), the set of preamble sequences are selected from a OGC set (inherent) formed from first and second sequence vectors (col. 13, line 47 – col. 14, line 12), the OGC set generated from the first sequence vector and a cyclic shift matrix of a second sequence vector (col. 13, line 47 – col. 14, line 12); and wherein the second fast transform is a fast orthogonal Gold code transform (FOGT) comprising the steps of 1) multiplying the

preamble signal with a first sequence vector and a forward permutation vector to generate a permuted preamble signal (col. 7, lines 52-63), the forward permutation vector mapping between i) the cyclic shift matrix and ii) a matrix of Walsh-Hadamaard sequences (col. 8, lines 5-18), and 2) applying the fast Hadamaard transform to the permuted preamble signal to generate the set of index values (col. 7, lines 45-50). It is obvious that the transform described by Rice could be used to match either the received signal itself or also the preamble sequence.

Regarding claim 27, Narvinger in view of Rice and in further view of Slonneger disclose the limitations of claim 26 as applied above. Further, Rice discloses that for step (b), the set of preamble sequences are selected from a OGC set (inherent) formed from first and second sequence vectors (col. 13, line 47 – col. 14, line 12), the OGC set generated from the first sequence vector and a cyclic shift matrix of a second sequence vector (col. 13, line 47 – col. 14, line 12); and wherein the second fast transform is a fast orthogonal Gold code transform (FOGT) comprising the steps of 1) multiplying the preamble signal with a first sequence vector and a forward permutation vector to generate a permuted preamble signal (col. 7, lines 52-63), the forward permutation vector mapping between i) the cyclic shift matrix and ii) a matrix of Walsh-Hadamaard sequences (col. 8, lines 5-18), and 2) applying the fast Hadamaard transform to the permuted preamble signal to generate the set of index values (col. 7, lines 45-50). It is obvious that the transform described by Rice could be used to match either the received signal itself or also the preamble sequence.

9. Claims 20-22 is rejected under 35 U.S.C. 103(a) as being unpatentable over Narvinger et al (US 6381229; hereafter "Narvinger") in view of Rice (US 5463657).

Regarding claim 20, Narvinger discloses a preamble detector for detecting one of a set of preamble sequences in a spread signal (abstract) comprising: a first correlator (fig. 9, refs. 413 and 418) correlating the received spread signal with a set of orthogonal sequences to provide a preamble (fig. 9; col. 12, lines 27-31). Narvinger further discloses that the random access signal is comprised of a preamble and data portion wherein the preamble contains a unique signature pattern for identification (col. 2, lines 10-18). It is described by Narvinger that in the random access communications system the identification and processing of signals must be performed quickly (col. 1, lines 30-45). Narvinger also discloses that the preamble sequences are spread with Gold Codes (col. 8, lines 20-25). Therefore, Narvinger discloses correlating the preamble signal with a set of Gold Codes using a fast transform to quickly detect a signature within a preamble (col. 8, lines 9-15; col. 7, lines 37-49). Although the use of a fast transform implies correlation by a set of index values, Narvinger does not explicitly disclose correlating the preamble signal with the set of preamble sequences in accordance with a fast transform to generate a set of index values, forming a decision statistic based on the set of index values, and selecting, as the detected one of the set of preamble sequences, a preamble sequence corresponding to the decision statistic. However, Rice teaches a spread spectrum system using a non-coherent (fast transform) correlator (col. 7, line 53 – col. 8, line 18), generating a set of index values or permuted sequences (col. 7, lines 60-63), a circuit forming a decision statistic based on the set of

index values (col. 8, lines 6-18), and a selector selecting, as the detected one of the set of sequences, a sequence or preamble corresponding to the decision statistic (col. 8, lines 16-18). Rice also teaches the benefits of using fast transforms to compute correlations (col. 7, lines 35-40). Therefore, it would have been obvious to one having ordinary skill in the art at the time which the invention was made to utilize the particular non-coherent correlation technique using fast transforms as taught by Rice for the selection of a preamble sequence method of Narvinger because it could be performed quickly and efficiently.

Regarding claim 21, Narvinger in view of Rice disclose the limitations of claim 20 as applied above. Further, Rice discloses that for step (b), the set of preamble sequences are selected from a OGC set (inherent) formed from first and second sequence vectors (col. 13, line 47 – col. 14, line 12), the OGC set generated from the first sequence vector and a cyclic shift matrix of a second sequence vector (col. 13, line 47 – col. 14, line 12); and wherein the second fast transform is a fast orthogonal Gold code transform (FOGT) comprising the steps of 1) multiplying the preamble signal with a first sequence vector and a forward permutation vector to generate a permuted preamble signal (col. 7, lines 52-63), the forward permutation vector mapping between i) the cyclic shift matrix and ii) a matrix of Walsh-Hadamaard sequences (col. 8, lines 5-18), and 2) applying the fast Hadamaard transform to the permuted preamble signal to generate the set of index values (col. 7, lines 45-50). It is obvious that the transform described by Rice could be used to match either the received signal itself or also the preamble sequence.

Regarding claim 22, Narvinger in view of Rice, in further view of Slonneger, and in further view of Gibson disclose the limitations of claim 20 as applied above. Further, Rice discloses the use of commercial processors (col. 15, lines 45-57). A processor is a type of integrated circuit.

Allowable Subject Matter

10. Claims 6-8 and 16-18 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following prior art of record not relied upon above is cited to further show the state of the art with respect to non-coherent correlation demodulators.

- U.S. Pat. No. 5638376 to Miki et al.
- U.S. Pat. No. 5598429 to Marshall.
- U.S. Pat. No. 5909471 to Yun.
- U.S. Pat. No. 5949817 to Marshall.
- U.S. Pat. No. 5761239 to Gold et al.
- U.S. Pat. No. 5953370 to Durrant et al.
- U.S. Pat. No. 5267271 to Rice.
- Chawla et al, "Parallel acquisition of PN sequences in DS/SS systems", IEEE Transactions on Communications, Volume: 42, Issue: 5, May 1994, Pages:2155 - 2164.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M Perilla whose telephone number is (703) 305-0374. The examiner can normally be reached on M-F 8-5 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Chin can be reached on (703) 305-4714. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jason M. Perilla
June 18, 2004

jmp

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